Table 5.2E-5 Construction Emission Totals

Construction Activity	lbs/day NOx	CO	VOC	SOx	PM10	PM2.5	tons per const period NOx	CO	VOC	SOx	PM10	PM2.5	tons per year NOx	CO	VOC	SOx	PM10	PM2.5
Main Site																		
Construction Equipment-Exhaust	106.3	54.1	16.0	0.1	6.14	6.10	38.6	19.6	5.80	0.010	2.23	2.21	14.036	7.127	2.109	0.004	0.811	0.804
Construction Site-Fugitive Dust	0.000	0.000	0.000	0.000	15.60	3.30	0.000	0.000	0.000	0.000	1.10	0.20	0.000	0.000	0.000	0.000	0.400	0.073
Construction Dust-Other	0.000	0.000	0.000	0.000	0.90	0.19	0.000	0.000	0.000	0.000	0.27	0.06	0.000	0.000	0.000	0.000	0.098	0.022
Site Delivery-Vehicle Exhaust	7.52	2.10	0.43	0.011	0.29	0.28	2.73	0.76	0.15	0.004	0.100	0.100	0.993	0.276	0.055	0.001	0.036	0.036
Site Support-Vehicle Exhaust	1.200	11.600	1.200	0.002	0.110	0.110	0.440	4.200	0.430	0.001	0.040	0.040	0.160	1.527	0.156	0.000	0.015	0.015
Worker Travel-Vehicle Exhaust	2.45	26.2	2.76	0.003	0.24	0.24	0.90	9.50	1.00	0.001	0.090	0.088	0.327	3.455	0.364	0.000	0.033	0.032
Track Out-Fugitive Dust	0.000	0.000	0.000	0.000	0.94	0.160	0.000	0.000	0.000	0.000	0.28	0.05	0.000	0.000	0.000	0.000	0.102	0.018
Unpaved Roads-Fugitive Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Paved Roads-Fugitive Dust	0.000	0.000	0.000	0.000	0.460	0.050	0.000	0.000	0.000	0.000	0.140	0.010	0.000	0.000	0.000	0.000	0.051	0.004
Offsite Linear Emissions are included in the above sector calculations, i.e., acreages, equipment types and use rates, schedules, etc.																		
TOTALS	**117.5**	**94.0**	**20.4**	**0.1**	**24.7**	**10.4**	**42.7**	**34.1**	**7.38**	**0.016**	**4.25**	**2.76**	**15.516**	**12.385**	**2.684**	**0.006**	**1.545**	**1.003**
Onsite Emissions for Modeling	*106.3*	*54.1*	*16.0*	*0.1*	*18.84*	*8.80*	*38.6*	*19.6*	*5.8*	*0.010*	*3.60*	*2.47*	*14.036*	*7.127*	*2.109*	*0.004*	*1.309*	*0.898*

Total Const Months: 33
Total Const Years: 2.75

CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS

Project: OGS

Assumptions:

1. The average diesel engine employed in construction equipment use consumes fuel at a rate of: 0.06 gal/hp-hr

Ref: EPA, NR-009b Publication, November 2002.
Ref: Sacramento County APCD Const. Program Data, V. 6.0.3, 3/2007.
Ref: EPA, NR-009c Publication, EPA 420-P-04-009, April 2004.
Ref: Niland Energy Project, IID, AFC Vol 2, App A.
Ref: South Coast AQMD PR XXI, Draft Staff Report, 3-15-95, and SCAQMD CEQA Manual, 11/03.
The above noted references present fuel consumption values which range from 0.050 to 0.064 gal/hp-hr for diesel engines used in construction related equipment. The value of 0.060 gal/hp-hr was chosen as a reasonable upper mid-range value for construction emissions calculations.

2. Construction equipment exhaust emissions will be calculated on an annual basis using the site specific equipment list, HP ratings, hours of use, days of use, etc. Annual emissions will be apportioned to daily values based on the estimated construction period time on site.

3. The equipment list derived from the South Coast AQMD (12/2006) will be used to establish the various equipment categories. Data produced by the Sacramento APCD was used to establish the average HP ratings for each equipment category. HP rating data was supplemented by data from SCAQMD CEQA Handbook (Table A9-8-C) if not available from Sacramento APCD.

4. Construction Schedule:	10	hrs/day	Construction Totals:	220	hrs/month
	5	days/week		7260	hrs/const period
	22	days/month		726	days/const period
	33	months			

5. Anticipated Construction Start Year: Late 2010 or early 2011

Equipment Category	Avg HP	# of Units Used for Project	Avg Use Rate Hrs/day	# of Days On Site (each)	Total Hrs/Day	Total Hp-Hrs per Day	Total Hrs per Const Period	Total Hp-Hrs per Const Period
Bore/Drill Rigs/Pile Drivers	217.7	2	10	30	20	4354	600	130620
Cement Mixers	11	1	10	10	10	110	100	1100
Industrial/Concrete Saws	83.7	1	10	10	10	837	100	8370
Cranes	190.4	4	10	500	40	7616	20000	3808000
Crawler Tractors/Dozers	143.4	2	10	60	20	2868	1200	172080
Crushing/Processing Eq.	154.3	0	0	0	0	0	0	0
Dump and Tender Trucks	223	5	10	180	50	11150	9000	2007000
Excavators	180	6	10	170	60	10800	10200	1836000
Forklifts/Aerial Lifts/Booms	83	5	10	400	50	4150	20000	1660000
Generators/Compressors	37	10	10	250	100	3700	25000	925000
Graders	174	2	10	120	20	3480	2400	417600
Off Highway Tractors	255.1	0	0	0	0	0	0	0
Off Highway Trucks	417.2	0	0	0	0	0	0	0
Other Const. Eq.-Diesel	240.3	0	0	0	0	0	0	0
Pavers	131.5	1	10	10	10	1315	100	13150
Paving Eq./Surfacing Eq.	110.9	0	0	0	0	0	0	0
Plate Compactors	8	4	10	450	40	320	18000	144000
Rollers/Compactors	113.9	2	10	100	20	2278	2000	227800
Rough Terrain Forklifts	94.2	0	0	0	0	0	0	0
Rubber Tired Dozers	352.5	0	0	0	0	0	0	0
Rubber Tired Loaders	165.3	0	0	0	0	0	0	0
Scrapers	313.2	4	10	60	40	12528	2400	751680
Signal Boards/Light Sets	118.8	5	10	180	50	5940	9000	1069200
Skid Steer Loaders	62	2	10	450	20	1240	9000	558000
Tractors/Loaders/Backhoes	79.5	0	0	0	0	0	0	0
Trenchers	28	0	0	0	0	0	0	0
Welders	35	10	10	250	100	3500	25000	875000
Other Const. Eq.-Gasoline	0	0	0	0	0	0	0	0

*includes equipment and use rates for proposed offsite linears.

Estimated Const Period Hp-Hrs = 14604600

Estimated Const Period Fuel Use = 876276 gals

2010 Equipment Emissions Factors

Equip. Type	HP	lbs/hp-hr CO	lbs/hp-hr VOC	lbs/hp-hr NOx	lbs/hp-hr SOx	lbs/hp-hr PM10
Bore/Drill Rigs/Pile Drivers	217.7	0.001400	0.000400	0.004700	0.000008	0.000200
Cement Mixers	11	0.003800	0.001400	0.006500	0.000009	0.000400
Industrial/Concrete Saws	83.7	0.006400	0.002500	0.006100	0.000008	0.000600
Cranes	190.4	0.001400	0.000500	0.004900	0.000005	0.000200
Crawler Tractors/Dozers	143.4	0.004300	0.001100	0.008500	0.000008	0.000500
Crushing/Processing Eq.	154.3	0.002500	0.000900	0.010200	0.000011	0.000300
Dump and Tender Trucks	223	0.001300	0.000400	0.002600	0.000004	0.000100
Excavators	180	0.003800	0.000800	0.006400	0.000007	0.000400
Forklifts/Aerial Lifts/Booms	83	0.002100	0.000600	0.003800	0.000004	0.000300
Generators/Compressors	37	0.005800	0.002200	0.006100	0.000008	0.000600
Graders	174	0.002000	0.000700	0.007200	0.000008	0.000300
Off Highway Tractors	255.1	0.004900	0.001300	0.010100	0.000008	0.000600
Off Highway Trucks	417.2	0.001500	0.000500	0.004600	0.000005	0.000200
Other Const. Eq.-Diesel	240.3	0.005900	0.002100	0.005600	0.000007	0.000500
Pavers	131.5	0.004400	0.001400	0.008100	0.000007	0.000700
Paving Eq./Surfacing Eq.	110.9	0.006600	0.002800	0.005300	0.000006	0.000600
Plate Compactors	8	0.001800	0.000300	0.002100	0.000004	0.000100
Rollers/Compactors	113.9	0.003500	0.001000	0.006200	0.000006	0.000500
Rough Terrain Forklifts	94.2	0.004200	0.000900	0.007400	0.000008	0.000400
Rubber Tired Dozers	352.5	0.003500	0.000700	0.006400	0.000005	0.000300
Rubber Tired Loaders	165.3	0.003600	0.000800	0.006600	0.000007	0.000400
Scrapers	313.2	0.002900	0.001000	0.009900	0.000009	0.000400
Signal Boards/Light Sets	118.8	0.002500	0.000500	0.003000	0.000006	0.000100
Skid Steer Loaders	62	0.005000	0.001600	0.004900	0.000007	0.000400
Tractors/Loaders/Backhoes	79.5	0.003000	0.000800	0.004700	0.000005	0.000400
Trenchers	28	0.004000	0.001300	0.007600	0.000006	0.000600
Welders	35	0.002300	0.000700	0.004100	0.000004	0.000400
Other Const. Eq.-Gasoline	0.0	0.003300	0.000900	0.006500	0.000006	0.000400

SCAQMD off-road emissions factor database, website, 12/2006. Load factor adjustments incorporated.
EFs are for equipment inventory year 2010.

Construction Period Emissions, lbs

Equip. Type	CO	VOC	NOx	SOx	PM10
Bore/Drill Rigs/Pile Drivers	183	52	614	1	26
Cement Mixers	4	2	7	0	0
Industrial/Concrete Saws	54	21	51	0	5
Cranes	5331	1904	18659	19	762
Crawler Tractors/Dozers	740	189	1463	1	86
Crushing/Processing Eq.	0	0	0	0	0
Dump and Tender Trucks	2609	803	5218	8	201
Excavators	6977	1469	11750	13	734
Forklifts/Aerial Lifts/Booms	3486	996	6308	7	498
Generators/Compressors	5365	2035	5643	7	555
Graders	835	292	3007	3	125
Off Highway Tractors	0	0	0	0	0
Off Highway Trucks	0	0	0	0	0
Other Const. Eq.-Diesel	0	0	0	0	0
Pavers	58	18	107	0	9
Paving Eq./Surfacing Eq.	0	0	0	0	0
Plate Compactors	259	43	302	1	14
Rollers/Compactors	797	228	1412	1	114
Rough Terrain Forklifts	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0
Scrapers	2180	752	7442	7	301
Signal Boards/Light Sets	2673	535	3208	7	107
Skid Steer Loaders	2790	893	2734	4	223
Tractors/Loaders/Backhoes	0	0	0	0	0
Trenchers	0	0	0	0	0
Welders	2013	613	3588	4	350
Other Const. Eq.-Gasoline	2888	788	5688	5	350

Totals	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	
lbs per const. period	39241	11631	77200	88	4461	4420.75	
tons per const. period	19.6	5.8	38.6	0.0	2.23	2.21	
Average lbs/day =	54.1	16.0	106.3	0.12	6.14	6.09	
Estimated Maximum lbs/day =	*83.8*	*24.8*	*164.8*	*0.2*	*9.5*	*9.4*	*note 3*
Average lbs/month =	1189.1	352.5	2339.4	2.7	135.18	133.96	
Average tons/year =	7.13	2.11	14.04	0.02	0.81	0.80	

CARB-CEIDARS, Updated Size Fractions for PM Profiles: PM2.5 = 0.991 of PM10 : Diesel Vehicle Exhaust
CO2 EF: CCAR General Protocol, June 2006, for CA-Low Sulfur Diesel combustion.

	CO2
lbs per const period	19243021
tons per const period	9622

Other Assumptions and References:

1. Trench construction times per: Southern Regional Water Pipeline Alliance, 3/08.
   Optimum trench construction progress rate is 80m (260ft) per day.
   Non-optimum trench construction progress rate is 30m (100 ft) per day.
   An average progress of 180 ft/day is used where applicable.
2. Paving speeds can range from 3 to 15 m/min depending on asphalt delivery rates and required compaction thickness.
   A minium paving speed of 3 m/min (10 ft/min or 600 ft/hr) I used where applicable.
   The minimum speed is based upon a 3" compacted layer, 12 ft lane width, with an asphalt delivery rate of ~ 140 tons/hr.
   Ref: Asphalt Paving Speed, Pavement Worktip No. 31, AAPA, 11/2001.
3. Estimation of maximum daily emissions is extremely variable. Some projects provide estimated manpower and equipment use schedules, but even this data usually leads to a wide range of assumptions being made in order to estimate equipment exhaust emissions for a maximum work day. The methodology used in this analysis assumes that the estimated maximum day represents the ratio of the number of pieces of equipment on site on any day during the maximum month as compared to the number of pieces of equipment on site on any day during an average month.

CONSTRUCTION PHASE-Main Project Site Fugitive Dust Emissions

MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:		20	
Max Acres Subject to Construction Disturbance Activites on any day:		20	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	5	
	Days/Month:	22	
	Const Period, Months:	33	2.8 years
	Const Period, Days:	726	

Wet Season Adjustment: (Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)

Mean # days/year with rain >= 0.01 inch:	70	
Mean # months/yr with rain >= 0.01 inch:	2.33	
Adjusted Const Period, Months:	26.58	
Adjusted Const Period, Days:	533.5	

Controls for Fugitive Dust:

Proposed watering schedule is every:	2.5	Hours

SCAQMD Mitigation Measures, Table XI-A, 4/07
2.5 hour watering interval yields ~80% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on mitigations proposed:	89	% control
Conservative control % used for emissions estimates:	89	% control
	0.11	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.032	0.007
tons/period	0.842	0.177
Max lbs/day	2.9	0.605

Cut and Fill Data:

Total cu/yds:		43000
10^3 cu/yds:		43
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059
PM10 uncontrolled emissions, tons/period:		2.54
Cut and Fill Activity Period, months:		2.0
Cut and Fill Activity Period, days:		44.0
PM10 Controlled Emissions:	tons/period	0.28
PM2.5 Controlled Emisisons:	tons/period	0.06
PM10 Controlled Emissions:	tons/month	0.14
PM2.5 Controlled Emisisons:	tons/month	0.03
PM10 Controlled Emissions:	max lbs/day	12.7
PM2.5 Controlled Emisisons:	max lbs/day	2.7

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**1.1**	**0.2**
tons/month	**0.2**	**0.0**
max lbs/day	**15.6**	**3.3**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.

CONSTRUCTION PHASE- Laydown Yard plus Offsite Linears
MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:		25.3	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0036	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	5	
	Days/Month:	22	
Const Period, Months:		33	2.8 years
Const Period, Days:		726	

Wet Season Adjustment: (Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)

Mean # days/year with rain >= 0.01 inch:	70	
Mean # months/yr with rain >= 0.01 inch:	2.33	
Adjusted Const Period, Months:	26.58	
Adjusted Const Period, Days:	533.5	

Controls for Fugitive Dust:

Proposed watering schedule is every	2.5	Hours

SCAQMD Mitigation Measures, Table XI-A, 4/07
2.5 hour watering interval yields ~80% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on watering interval rati	89	% control
Conservative control % used for emissions estimates:	89	% control
	0.11	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.010	0.002
tons/period	0.266	0.056
Max lbs/day	0.9	0.191

Cut and Fill Data:

Total cu/yds:		0
10^3 cu/yds:		0
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059
PM10 uncontrolled emissions, tons/period:		0.00
Cut and Fill Activity Period, months:		0.0
Cut and Fill Activity Period, days:		0.0
PM10 Controlled Emissions:	tons/period	0.00
PM2.5 Controlled Emisisons:	tons/period	0.00
PM10 Controlled Emissions:	tons/month	0.00
PM2.5 Controlled Emisisons:	tons/month	0.00
PM10 Controlled Emissions:	max lbs/day	0.0
PM2.5 Controlled Emisisons:	max lbs/day	0.0

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**0.266333**	**0.06**
tons/month	**0.010019**	**0.00**
max lbs/day	**0.9**	**0.19**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
EF of 0.0144 tons/acre/month reduced by 75% to account for emissions from laydown yard surface use
30% of which is paved.
Acreage includes the offsite linear surface area of 5.3 acres.

PAVED ROAD FUGITIVE DUST EMISSIONS
(associated with construction traffic)

Length of Paved Road used for/by Construction Access:		0.3	miles, roundtrip distance***
Avg weight of vehicular equipment on road:		4.3	tons (range 2 - 42 tons)
Road surface silt loading factor:		0.28	g/m2 (range 0.03 - 400 g/m2)
Particle size multiplier factors:	PM10	0.023	lb/VMT
	PM2.5	0.0034	lb/VMT
C factors (brake and tire wear):	PM10	0.00047	lb/VMT
	PM2.5	0.00036	lb/VMT
Avg vehicle speed on road:		25	mph (range 10-55 mph)
Number of vehicles per day:		262	
Number of construction work days per month:		22	
Total vehicles per month		5764	
Number of construction work months:		26.58	after wet season adjustment*
Total vehicles per const period:		153207.1	

VMT/day:	78.6
VMT/month:	1729.2
VMT/period:	45962.14

	PM10	PM2.5	
Calc 1	0.207	0.207	
Calc 2	1.334	1.334	
Calc 3	0.006	0.0006	lb/VMT

Emissions	PM10	PM2.5
lbs/day	0.46	0.05
lbs/month	10.19	1.00
lbs/period	270.89	26.69
tons/period	0.14	0.01

Default Silt Load Values for Paved Road Types

Freeway	0.02 g/m2
Arterial	0.036 g/m2
Collector	0.036 g/m2
Local	0.28 g/m2
Rural	1.6 g/m2

* see main const dust site page for this value
EPA, AP-42, Section 13.2.1, March 2006, updated 9/2008.
Allocation of emissions from the project traffic will be based on a 0.3 mile roundtrip adjacent to the project site, with trackout emissions allocated to the remaining 0.11 miles.

CONSTRUCTION PHASE - Truck Delivery and Site Support Vehicle Emissions

Ref: SFAB, Emfac 2007, V2.3, Nov 2006
On-Road Heavy Duty Diesels (1967-2011

Avg # deliveries/day:	10.0				Emissions Factors (lbs/vmt)						
Avg Haul Distance (miles)	30	see note below		NOx	CO	VOC	SOx	PM10	CO2		
VMT/Day:	300.0			0.025066	0.007002	0.001418	0.000036	0.000955	3.785		
Work days/yr:	264					Daily Emissions (lbs)					
Total Const Work Days:	726			**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**CO2**	**PM2.5**	
Total # of Deliveries:	7260			**7.520**	**2.101**	**0.425**	**0.011**	**0.287**	**1135.500**	**0.284**	
						Tons per Const Period					
				2.730	0.763	0.154	0.004	0.104	412.187	0.103	

Site Support Vehicle Emissions											
Total # of vehicles:	40		**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**CO2**			**PM2.5**
# of Pickups (gas):	36		0.001108	0.010723	0.001096	0.000001	0.000098	1.096509	lbs/vmt*	gasoline	
# of Pickups (diesel):	4		0.000039	0.000016	0.000002	0.000011	0.000002	0.008964	lbs/vmt*	diesel	
Avg. pickup daily vmt:	30		**1.1966**	**11.5808**	**1.1837**	**0.0011**	**0.1058**	**1184.2297**	**lbs/day**	**gasoline**	**0.10562832**
Total Gas VMT:	1080		**0.0047**	**0.0019**	**0.0002**	**0.0013**	**0.0002**	**1.0757**	**lbs/day**	**diesel**	**0.0002**
Total Diesel VMT:	120										
			0.4344	4.2038	0.4297	0.0004	0.0384	429.8754	**tons/period**	**gasoline**	0.0383
			0.0017	0.0007	0.0001	0.0005	0.0001	0.3905	**tons/period**	**diesel**	0.0001

Ref: SFAB, Emfac 2007, V2.3, Nov 2006
LDTs (gas and diesel), 1967-2011

Avg haul distance: one way distance from site to either Concord or Oakland.
These trucks will not be dedicated to the site, so backhaul distances are not included.

CARB-CEIDARS, Updated Fractions for PM Profiles: PM2.5 = 0.991 of PM10 for Diesel Exhaust, and 0.998 for Gasoline Vehicles.

It should be noted that these emissions are not necessarily new emissions to the regional air shed. A significant portion of the truck services will be derived from the existing regional truck services vehicle pool, and as such these truck emissions would most likely be involved in deliveries in the area regardless of whether or not the proposed facility is constructed. As such, a major portion of the above estimated emissions would not be considered as additions to the air shed.

;
l)

;

CONSTRUCTION PHASE - Worker Travel - Emissions

Ref: SFAB, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (1967-2011)
LDP/LDT Weighted Avg Efs

Max # of Workers/Day:	729	
Avg # of Workers/Day:	303	
Avg Occupancy/Vehicle:	1.5	
Round Trips/Day:	202	
Avg Roundtrip Distance:	15	miles
VMT/Day:	3030	
VMT/Const Period:	2199780	
Total Const Days:	726	

Emissions Factors (lbs/VMT)

NOx	CO	VOC	SOx	PM10	CO2
0.00081	0.00864	0.00091	0.000001	0.00008	0.96325

Avg. Daily Emissions (lbs)

NOx	CO	VOC	SOx	PM10		PM2.5
2.454	**26.179**	**2.757**	**0.003**	**0.242**	**2918.648**	**0.242**

Tons per Const Period

0.8909	**9.5030**	**1.0009**	**0.0011**	**0.0880**	**1059.4690**	**0.0878**

It should be noted that these emissions are not necessarily new emissions to the regional air shed. A significant portion of the workers will be derived from the existing work force pool in the urban regional area, and as such these workers would most likely be involved in projects in the area regardless of whether or not the proposed facility is constructed. As such, a major portion of the above estimated emissions would not be considered as additions to the air shed.

CONSTRUCTION PHASE - Trackout Emissions

Paved Road Length (miles):	0.11	estimated roundtrip trackout distance				
Daily # of Vehicles:	262					
Avg Vehicle Weight (tons):	4.3			PM10	PM2.5*	
Total Unadjusted VMT/day	28.8			0.207		
Particle Size Multipliers	PM10			1.334		
lb/VMT	0.023			0.001	0.0001	lb/VMT
C factor, lb/VMT	0.00047			**0.943**	0.1594	**lbs/day**
Road Sfc Silt Loading (g/m^2):	0.28			**0.010**	0.0018	**tons/month**
# of Active Trackout Points:	1			**0.28**	0.0466	**tons/period**
Added Trackout Miles:	PM10					
Trackout VMT/day:	1572		*Default Silt Load Values for Paved Road Types*			
Final Adjusted VMT/day	1601			Freeway	0.02 g/m2	
Final Adjusted VMT/month	35218			Arterial	0.036 g/m2	
Final Adjusted VMT/period	936096			Collector	0.036 g/m2	
Construction days/month:	22.0			Local	0.28 g/m2	
Construction months/period:	26.6			Rural	1.6 g/m2	
Control Applied to Trackout:	Sweeping and Cleaning (Water washing)					
Control Efficiency, %	90	0.9	Release Factor =		0.1	

* PM2.5 fraction of PM10 assumed to be 0.169 (CARB CEIDARS updated fraction values) for paved roads.

EPA, AP-42, Section 13.2.1, Proposed revisions dated 9/2008.
Use silt loading factor from default values for road type if no site specific data is available.
Trackout effects approximately 300 ft of roadway arriving and departing from the site access point.

CO2e Emissions Estimates

Total CO2 emisisons from diesel combustion:	10034.6	tons/period
Total CO2 emissions from gasoline combustion:	1489.4	tons/period

Approximate methane fraction of CO2 for diesel combustion:	0.000051
Approximate N2O fraction of CO2 for diesel combustion:	0.000032
Approximate methane fraction of CO2 for gasoline combustion:	0.000213
Approximate N2O fraction of CO2 for gasoline combustion:	0.000113

Estimated methane from diesel combustion:	0.511765	tons/period
Estimated N2O from diesel combustion:	0.321107	tons/period
Estimated methane from gasoline combustion:	0.317242	tons/period
Estimated N2O from diesel combustion:	0.168302	tons/period

Estimated methane CO2e from diesel combustion:	10.74706	tons/period
Estimated N2O CO2e from diesel combustion:	99.54323	tons/period
Estimated methane CO2e from gasoline combustion:	6.662086	tons/period
Estimated N2O CO2e from gasoline combustion:	52.17368	tons/period

Total CO2e emissions from construction: 11693 tons/period

10524 metric tons/period

CCAR General Protocol, Jan 2009, Version 3.1.
IPCC SAR values for methane and N2O.

Average Vehicle Weight Estimate for Construction Period

Vehicle Type	Weight tons	# Vehicles per day	Frac. of total vehicles
Passenger Cars	2	202	0.771
LD Pickups	3	40	0.153
MD Pickups	4	0	0.000
HD Loaded*	40	10	0.038
HD Unloaded*	20	10	0.038
Buses	0	0	0.000
		262	1.000

Weighted Avg Vehicle Weight, tons : 4.3

* Ref: Liberty Energy XXIII DEIR, City of Banning, CA., Aspen Environmental Group, June 2008.